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ABSTRACT OF THE DISCLOSURE

An apparatus for treating an exhaust gas stream from cold startup through continuous operating conditions of an internal combustion engine includes an oxidizing catalyst bed disposed in an exhaust pipe and a reducing catalyst bed disposed in the exhaust pipe downstream from the oxidizing catalyst bed. The oxidizing catalyst bed has one or more oxidizing catalysts and the reducing catalyst bed has one or more reducing catalysts. A method is provided for treating an exhaust gas stream both during cold start and during continuous operating conditions of an internal combustion engine by passing the stream through an oxidizing catalyst bed having one or more oxidizing catalysts at a light off temperature; a reducing catalyst bed having one or more reducing catalysts and providing hydrogen into the reducing catalyst bed to condition the reducing catalyst; and introducing hydrogen into the internal combustion engine during cold startup.

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